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ABSTRACT

A new approach is being tested at Michigan State University (MSU) to support technology integration within the teacher education (TE) program. A group of technology guides are supporting instructors who are teaching common courses in the teacher preparation program. This change in focus from supporting TE undergraduate students to supporting TE instructors represents an important change in philosophy with regard to plans to prepare future teachers for adaptive and pedagogical uses of technology. Technology guides provide a variety of services, including technology workshops, one-on-one instructor consulting, establishing World Wide Web-based resources, setting up and moderating discussion lists, publishing newsletters, and showcasing exemplary uses of technology within the college. The technology guides work with TE instructors to determine how ongoing technology research projects might be helpful for prospective teachers. They help ensure that graduates of the MSU TE program have satisfied state requirements for technology proficiency and support instructor use of technology in their regular teaching practices. When TE instructors work collaboratively with technology guides, results can be impressive and lead to learning on the part of both instructor and guide. (AEF)

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Technology Guides for Teacher Education at MSU

Andrew Topper
Michigan State University

MSU has been working for several years to incorporate technology into the teacher preparation program. The state of Michigan requires that all student teachers be competent with technology, so MSU has an obligation to ensure that its students meet these legal requirements. The college of education has taken steps to infuse technology into the teacher education program by helping faculty and students use the technology, establishing the Technology Exploration Center for faculty and students in Erickson Hall, hiring technology coaches (previously known as technology mentors) to support faculty and students' use of technology, and hiring faculty with extensive technology experience.

A variety of methods have been used to help educate staff and support innovative uses of technology within the college. In 1997, a new approach is being tested to support technology integration within the MSU teacher education program. Instead of directly supporting students in the TE program, a group of technology guides are supporting instructors who are teaching common courses in the teacher preparation program. These include TE301, TE401, TE402, TE801, and TE813, and represent the largest portion of subject matter specific classes in the TE program. This change in focus, from supporting the TE undergraduate students to supporting TE instructors, represents an important change in our philosophy with regard to our plans to prepare future teachers for adaptive and pedagogical uses of technology.

Toward this end, technology guides provide a variety of services including technology workshops, one-on-one instructor consulting, establishing Web-based resources, setting up and moderating discussion lists, publishing newsletters, and showcasing exemplary uses of technology within the college. An effort has been made to encourage and support innovative uses of technology in teaching within the TE program so that prospective teachers can observe, examine, and discuss models of teaching with technology as they move through their undergraduate program.

Goals for the technology guides are to:

- Foster and facilitate TE instructors' use of technology within the teacher preparation program
- Support faculty uses of technology in teaching
- Showcase exemplary uses of teaching with technology
- Develop and support virtual communities within and around the teacher education program based on domains of interest
- Conduct research on technology adoption within the MSU teacher education program
- Support and monitor TE students progress towards technology requirements

History of technology adoption at the MSU College of Education

In the 1992 the MSU Department of Teacher Education formed a working committee to explore possible solutions to the challenge of exposing preservice teachers to technology. The committee was composed of faculty who had interests in teacher education and technology and who taught in the teacher preparation programs. Faculty in the MSU teacher education program decided that technology would only have an impact on education when teachers saw and used it in the same way they used libraries, textbooks, blackboards, pencils, and paper.

From a pragmatic perspective, MSU teacher education faculty members ran into several constraints on their efforts to implement a technology component in the teacher preparation program. First and foremost, were issues of autonomy and control each of the preparation teams had over the program. Initially, technology education was to occur within two hours of class time each week and was to be provided by faculty or staff from each team. This made the goal of embedding technology in curricular contexts very difficult and resulted in a focus on of a small set of generic tools which could be used in a variety of educational settings instead of a contextual technology use approach.

As a result of these constraints, little attention was paid to curricular-specific technology. A change in focus also occurred when necessary funding for faculty training and support was not forthcoming in the second year of the program. This led to a perception within the teacher preparation program, both on the part of faculty and students, of technology as an additional task and not an integral part of learning to teach.

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Later, technology coaches (also called mentors) were hired by the college to support students learning to use technology and to assess their technological proficiency in five areas: e-mail, Internet, word processing and presentations, database and spreadsheet, and subject-area software.

Technology projects at MSU

Within the college there are a variety of ongoing research projects, that have used technology in teaching and learning. Examples include the MathLab project, the Learning Exchange for Teachers and Students through the InterNet (LETSNet), the Center for Advanced Learning Systems, the Technology Challenge Grant, the Institute for Research on Teaching & Learning Across the Life Span, the Technology Enhanced Learning Environment, and the Reading Classroom Explorer. [Note: All of these projects are described on the College of Education website.]

While these projects have focused on specific aspects of teaching and learning with technology and on research, they have not been used extensively within the college as resources for teacher preparation. The college is still trying to determine how the outcomes from these various technology research projects can be incorporated into the teacher preparation program.

For example, technology guides work with TE instructors to determine how the technology projects might be helpful for prospective teachers. In the case of some projects, such as the MathLab and LETSNet, there are valuable examples or models of teaching with technology now available to TE instructors and their students. Making TE instructors and students aware of these resources is an important part of what technology guides and TE instructors accomplish together.

Teacher Education Course Instructors

Within the Teacher Education (TE) program in the MSU college of education, graduate students in the TE Ph.D. program teach many of the core teacher preparation courses. While many of these students have extensive experience in K-12 classrooms, most of them have not taught classes at the college level or used technology in support of their teaching.

Some faculty members in the college of education also teach undergraduate teacher preparation classes. Most of these faculty members have little background or experience incorporating technology into their own teaching practices. While prior attempts to integrate technology into the TE program have focused on undergraduate students, we felt that providing support for TE instructors would represent a better long-term strategy for the college.

We believe that until TE instructors regularly use technology in their teaching, TE students will not understand or appreciate how technology can be integrated into teaching subject matter. Seeing their instructors use technology will provide TE students with real-world examples of teaching with technology and will hopefully stimulate ongoing discussions about the role of technology in educational at all levels. We realize that this process of technology adoption at the college level may take some time, but we strongly believe it is essential to preparing future K-12 teachers for their own technology uses.

Technology guides, working with TE instructors, have developed a Web-based technology proficiency resource that includes a self-assessment that teacher education students can use to measure their progress towards technology proficiency. See http://rorschach.educ.msu.edu/TechReq/techrequirements.html. The on-line resource also includes a description of the technology requirements, a rationale for these requirements, and examples of how these requirements can be met. Currently, the MSU standards for teacher proficiency with technology call for simple or functional use of the four of the five areas suggested above, as well as one case of pedagogical or adaptive technology use.

Working with TE instructors, technology guides can help ensure that graduates of the MSU teacher education program have satisfied the state requirements for technology proficiency and support instructor use of technology in their regular teaching practices.

Role of the technology guides

Ongoing work for technology guides includes (a) creating and moderating a discussion list for the participants so they can have their questions answered throughout the year; and (b) creating a web page for the TE technology program with photographs of all technology guides and links to their home pages, to exemplary courses on the Web, to TE instructor web pages, and to supportive resources.

Duties for technology guides throughout the term include teaching 90-minute workshops, identifying tips of the day, identifying and showcasing exemplary uses of technology, working collaboratively with TE instructors, and monitoring student completion of technology requirements. Several technology guides are also responsible for supporting specific technology projects by incorporating the use of laptop computers into the TE internship program.

The principal role for technology guides is to support TE instructors as they work to incorporate technology into their TE classes. For those TE instructors who are not yet ready or willing to integrate technology into their teaching, technology guides also provide support to their TE students in accordance with the state mandate for technology competency.

There are a variety of benefits to using this approach including:

- More contact between TE instructors and the technology guides
- A jointly created body of knowledge about how to teach these courses

- Instructors develop their own practices and ways to teach the courses using technology
- Establishment of relationships between technology guides and Teacher Education teams
- Supporting virtual communities across physical boundaries
- Storing and passing on TE course materials among TAs
- Opportunities for TE instructors to engage in research practicum projects by studying their own teaching (practicum requirement)

Research component

As part of this effort, we are also building an infrastructure to support instruction with technology within the MSU Teacher Education program. We will do this by encouraging creation of a social support network for thinking about technology and opportunities to discuss the impact of technology on teaching. Key to this approach is the view of technology as a culture, not a subject, and a focus on content - teaching subject matter with technology, rather than a team-focused approach.

There are opportunities to collect data including interviews with people in the TE program, including students, faculty members, and instructors. For example, observing the instructors in the classroom as a basis for follow-up - using a guided practice approach; archive conversations: how do you teach with technology; multiple perspectives, etc.

In addition, some student teachers (student teachers or interns) in Detroit, Flint, and other outlying areas will be given PowerBooks to use in the field. These PowerBooks are meant to facilitate communication within the triads - interns, collaborating teachers, and field instructors - given the difficulty of meeting regularly face-to-face throughout the term.

Technology guides also work with the field instructors, interns, and collaborative teachers (triads) on fostering these communications over e-mail and supporting these people in the field. In addition, some of the participating interns and collaborating teachers were invited to take part in TE301/401/801 class discussions and assignments.

Supporting TE instructors

Each technology guide has been assigned to contact and offer support to a set of TE instructors. Some of these instructors welcome the help and support offered by the technology guides, while others are ambivalent or unready to consider how they might incorporate technology into their teaching. This is a similar problem faced by many technology advocates in K-12 schools.

When TE instructors do agree to work collaboratively with technology guides to bring technology into their courses, the results can be very impressive and lead to learning on the part of both the instructor and the technology guide. The examples described below are a few of the kinds of experiences technology guides have had working collaboratively with TE instructors.

Secondary Science TE401: Using e-mail and a spreadsheet

Deb Smith teaches a section of TE401 for secondary science majors and used two of her class sessions to demonstrate how her students could use technology: e-mail, with attachments, sent to her; and a spreadsheet, to collect and analyze data and generate a graph. Deb Smith wrote about her experiences in the computer lab:

> There were the usual server crashes, disk problems, etc. — mostly because when we made the Eudora disks originally, Yong came in and used his account, remember? So, many of their disks apparently had Yong's email address on them, and when they tried to sign on, of course the machine wanted his password. But we got that straightened out, with Deepak's and Tim Smith's help, and several other TEC guides who came over for short periods of time to help us.
>
> I think the seniors were intrigued by the possibilities that Clarisworks showed them for spreadsheet representations, and played around a lot of different graphs and charts. And my in box is full of email and attachments from them today, so I'd say that they all accomplished getting that checked off. :)
>
> Thanks for your continuing support and help, both in helping me learn new things and in making it possible for my students to do the same.

These comments show that Deb is now feeling more comfortable with technology herself, is especially grateful for the support she gets from the technology guides, feels she has learned a lot, and is also confident she is helping her students learned and meet the technology requirements.

Elementary Social Studies TE401: Collecting Primary Sources for Social Studies

[URL=http://rorschach.educ.msu.edu/TechReq/TE401_9/]

Lynn Brice and Tim Smith developed a database assignment for Lynn's TE401 class (Section 9, Fall 1997) where their students helped construct a database to organize their annotated bibliographies of useful social studies references.

These references were collected from a variety of sources, including books and the World Wide Web (WWW), and gathered into a single database for distribution to all students in class. The students met in the Mac lab (EH132) and learned about databases, designed the database for the annotated references, and used the Web to locate potential references.

Tim created a document describing databases and how to create them in ClarisWorks 4.0. Lynn used this assignment to help her students satisfy the database technology requirement (simple or fundamental use) as well as optionally to satisfy the e-mail and Web requirement (simple or fundamental use). Students could e-mail their Web book-

marks or database entries to Lynn or Tim, satisfying the e-mail requirement as well as the Web requirement.

Conclusion

While the MSU College of Education has taken small steps towards integrating technology into the teacher education program, we believe we have made great strides this year and our approach will eventually prove successful in the long term. We fully expect to modify our approach, especially the way we implement various aspects of the support we provide for TE instructors and faculty, as we gather more information and evaluate the success of these activities.

We also realize that this process of technology adoption may ultimately result in fundamental changes in the way we prepare future teachers within the college of education and as such may represent a 10-year program of change. This represents a challenge to all of us in the college, students and faculty included. We are hiring new technology-savvy faculty members who we believe will help us in these efforts and we expect to continue to lead the country in the use of technology in teacher education. It is through these efforts that we believe we will see our graduating teachers themselves begin to use technology in innovative and transformative ways.

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